

## CHAPTER 9

### GENERAL EQUIPMENT DECONTAMINATION PROCEDURES

9-1. General. This chapter describes the procedures for the decontamination of field equipment potentially contaminated in conjunction with UST removal. This process recommends but does not necessarily dictate the proper decontamination methods for any given situation. The contractor will be responsible for assessing specific situations for the most appropriate response. Decontamination is performed as a QA measure and a safety precaution. It prevents cross-contamination among samples and helps maintain a clean working environment for the safety of all field personnel and any others who may be affected.

Decontamination is mainly achieved by rinsing with liquids that include detergent solutions, potable water, deionized water, nitric acid, methanol, and hexane. Equipment is allowed to air-dry after being cleaned or is wiped dry with paper towels. Equipment can then be reused immediately. Steam cleaning should be used whenever visible contamination exists and for large machinery/vehicles. The reader should refer to EM 200-1-3 for additional guidance on decontamination. Also, guidance may be found in ASTM Standard Practices D 5088 and D 5608.

9-2. Precautions. It is important to ensure that investigation-derived wastes are not being generated as a result of decontamination chemicals.

9-3. Equipment. Materials used for decontamination may include but are not limited to:

- Wash basins (approximately 75 liters [20 gallons]).
- Buckets (10 to 20 liters [3 to 5 gallon]).
- Brushes.
- Squeeze bottles/spray cans.
- Alconox or equivalent detergent.
- Methanol.
- Nitric acid.
- Hexane.
- Potable water of known quality.
- Deionized water.
- Aluminum foil.

9-4. Operations, Procedures, and Instructions. Field personnel responsible for equipment decontamination should be familiar with all safety rules and regulations, the use of equipment and procedures for decontamination of equipment, and the standard practices governing equipment decontamination.

a. Operations.

- (1) Decontaminate all equipment prior to field use.

- (2) Clean the equipment on the assumption that it is highly contaminated until enough data are available to allow an accurate assessment of the level of contamination.
  - (3) Have an adequate supply of rinsing liquids and all materials. Perform decontamination in the same level of protective clothing as sampling activities unless a different level of protection is specified by the project manager.
  - (4) Collect and hold all decontamination liquids until they can be properly disposed. The procedure for full field decontamination must be followed without deviation unless specified by the project manager.
- b. Decontamination Staging Area. A staging area may be required for decontamination of drilling rigs and heavy equipment. The staging area must be constructed to:
- (1) Allow easy access for equipment to move in and out of the staging area.
  - (2) Contain all wash waters and any spray.
  - (3) Allow collection of all wash water into 55- gallon drums or tanks.
  - (4) Minimize cross-contamination.

Typically, a decontamination area consists of a plastic-lined area that drains to a sump where a submersible pump can remove the decontamination water and deposit it in drums, tanks, or in the sanitary sewer.

c. Decontamination Steps.

- (1) The purpose of the initial decontamination step is to remove gross contamination. Remove any solid particles from the equipment or material by brushing and then rinsing with available potable water. Use only water that is known to be contaminant-free. Record the source of the water in the field logbook and collect a sample for analysis if the source has not been analyzed. For drilling equipment, steam cleaning is necessary.
- (2) Wash equipment with soap or detergent solution.
- (3) Rinse with potable water by submerging or spraying.

- (4) Use an optional rinse with a solvent (methanol) to dissolve and remove soluble organic contaminants. Hexane may be used to dissolve waste lubricating oils, tars, and bunker fuels.
- (5) Use an optional rinse with a diluted nitric acid solution to dissolve and remove soluble inorganic metals.
- (6) Rinse thoroughly with distilled water.
- (7) Air-dry equipment or rinse with nanograde methanol to expedite drying.
- (8) Samples of drippings from the last rinse in Step 6 may be collected and analyzed to verify and document the effectiveness of the decontamination procedure. This type of sample is called an equipment/rinsate blank. The results of these analyses are not usually available for at least one week after they arrive in the laboratory. It is, therefore, important to thoroughly decontaminate all equipment to prevent cross-contamination of samples and prevent the detection of contaminants in the rinsate blank.
- (9) Allow item to completely air-dry prior to any use. Cover item if it is not intended for immediate use. Place large items on a clean sheet of plastic.
- (10) Wrap the item in aluminum foil if it is not going to be used immediately. Larger items should be wrapped in clean plastic sheets until they are ready for use.

d. Post-Operation Procedures-Field.

- (1) Decontaminate as much sampling equipment as possible and properly discard expendable items that cannot be decontaminated. Proper disposal shall include onsite drumming of liquids and solids in approved 55-gallon drums for temporary storage prior to subsequent disposal.
- (2) Prepare the rinsate blank sample and transport it according to all federal, state, local, and USACE regulations and/or requirements.
- (3) Store drums of rinse water/solids after decontamination in a secure area.

e. Post-Operation Procedures-Office.

- (1) Inventory equipment and supplies. Repair or replace all broken or damaged equipment. Replace expendable items. Return

equipment to the equipment manager and report incidents of malfunction or damage.

- (2) Contact the analytical laboratory to ensure the samples arrived safely and that instructions for analyses are clearly understood.
- (3) After receiving the results of the laboratory analyses, arrange for the disposal of wastes generated during the investigation.

9-5. Waste Disposal and Recycling.

a. Waste that is generated during equipment decontamination will likely consist of wastewater. Package wastewater in DOT-approved 55-gallon containers for shipment to a disposal facility.

b. Occasionally, solvents such as hexane are utilized in the decontamination process. Hexane decontamination fluid, which is ignitable, is ordinarily regulated as a RCRA hazardous waste; however, opportunities for recycling do exist. Federal regulation allow RCRA characteristic waste, such as hexane, to be mixed with used oil and burned as used oil fuel provided the resultant mixture does not exhibit any RCRA hazardous characteristic. In other words, hexane containing decontamination fluid can be mixed into used oil provided the flashpoint of the resultant mixture is greater than 60 degrees C (140 degrees F) and the mixture does not exceed threshold concentrations for TCLP constituents. This is permissible according to federal regulation, but may be prohibited by individual states. Alternatively, the hexane can be disposed of by burning for energy recovery at a permitted RCRA TSDF.

c. Occasionally, methanol is used for decontamination. Minimize use of methanol because it is regulated as a listed hazardous waste.

9-6 Waste Minimization During Decontamination Operations. To prevent the generation of excessive volumes of decontamination fluids, implement an active waste minimization policy to circumvent the generation of large quantities of decontamination fluid. Activities that could be implemented to reduce wastewater volume include the use of low flow water applicators during decontamination.